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Manoharachariella indica sp. nov. from the Western Ghats, India

Kunhiraman C. Rajeshkumar[1] & Sanjay K. Singh[2]

National Facility for Culture Collection of Fungi,
MACS' Agharkar Research Institute, G.G. Agarkar Road, Pune, India
Correspondence to: [1]*rajeshfungi@gmail.com* & [2]*singhsksingh@gmail.com*

Abstract — *Manoharachariella indica* is described as a new species from India, differing from *M. lignicola*, the only other described species of the genus, by larger conidia, longer conidiophores, and additional conidiophore septa.

Key words — anamorphic fungi, dematiaceous hyphomycete, Tamhini Ghats, Maharashtra

Introduction

The Western Ghats, one of the world's most diverse 'biodiversity hot spots,' is unique and diverse for its fungal wealth. Studies on microfungi and exploration of fungal diversity from different microhabitats in the Western Ghats are routinely conducted by the National Fungal Culture Collection of India (NFCCI) (Rajeshkumar et al. 2010, 2011a, b; Singh et al. 2009, 2010). During a September 2011 expedition to explore microfungal diversity in the Mulshi and adjoining areas we discovered a dematiaceous hyphomycete on a dead twig from the bamboo dominating the evergreen patch in the valley of the Tamhini Ghats.

Bagyanarayana et al. (2009) recently established *Manoharachariella* for *M. lignicola* Bagyan. et al. from litter in Andhra Pradesh, India. Monoblastic integrated conidiogenous cells that produce solitary doliiform obpyriform dictyoseptate apiculate conidia characterize this dematiaceous hyphomycete genus. We describe a second species in this genus.

Materials and methods

Isolates and morphology — Conidia were isolated directly from the surface of a dead twig and observed under a Nikon binocular stereomicroscope (Model SMZ-1500 with Digi-CAM, Japan). Single conidial cultures were established on 2% potato dextrose agar plates (PDA; Crous et al. 2009). For morphotaxonomic studies and photomicrographs, Zeiss (AXIO Imager 2, Germany) and Olympus (Model CX-41,

Japan) microscopes were used. Conidia and conidiophores were mounted in lactic acid cotton blue and measured using an ocular micrometer (and confirmed with software available with the Zeiss microscope), with 30 observations per structure. Culture colony characteristics were studied on two different media: 2% malt extract agar (MEA) and PDA (Crous et al. 2009). Herbarium specimens are deposited in the Ajrekar Mycological Herbarium (AMH), and the culture NFCCI 2630 was accessioned and preserved at NFCCI; WDCM-932, Agharkar Research Institute, Pune, India.

Taxonomy

Manoharachariella indica Rajeshkumar & S.K. Singh, **sp. nov.** Plates 1–3

MycoBank MB 563453

Differs from *Manoharachariella lignicola* by larger conidia, longer conidiophores, and additional conidiophore septa.

Type: India, Maharashtra, Tamhini Ghats, on dead twigs, September 2011, K.C. Rajeshkumar (**Holotype**, AMH 9438; ex-type culture NFCCI 2630).

Etymology: *indica,* referring to the country where this fungus is native.

Colonies effuse, thin, mid to dark brown or blackish brown, mycelium superficial or semi immersed or immersed, hyphae pale to dark brown, smooth, 4–6 µm. Stroma none. Setae and hypopodia absent. Conidiophores macronematous, mononematous, straight or flexuous, sparingly branched, arising laterally and apically from the immersed mycelium, 5–15-septate, smooth, pale to dark brown 76–276 × 6–10.8 µm. Conidiogenous cells monoblastic, integrated, terminal or

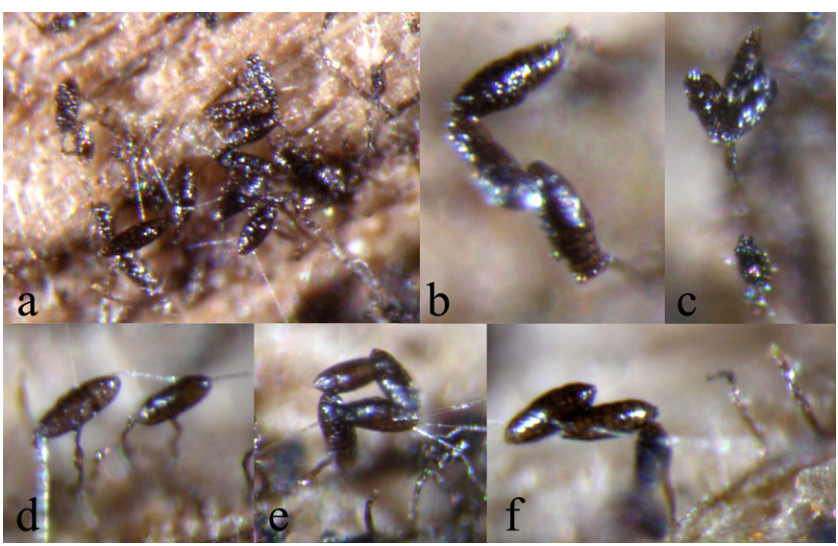

Fig. 1. *Manoharachariella indica* (holotype): a. Habit. b. Sticky conidia in false chain. c. Terminal and lateral conidiogenesis. d–f. Conidiophores and conidia in nature.

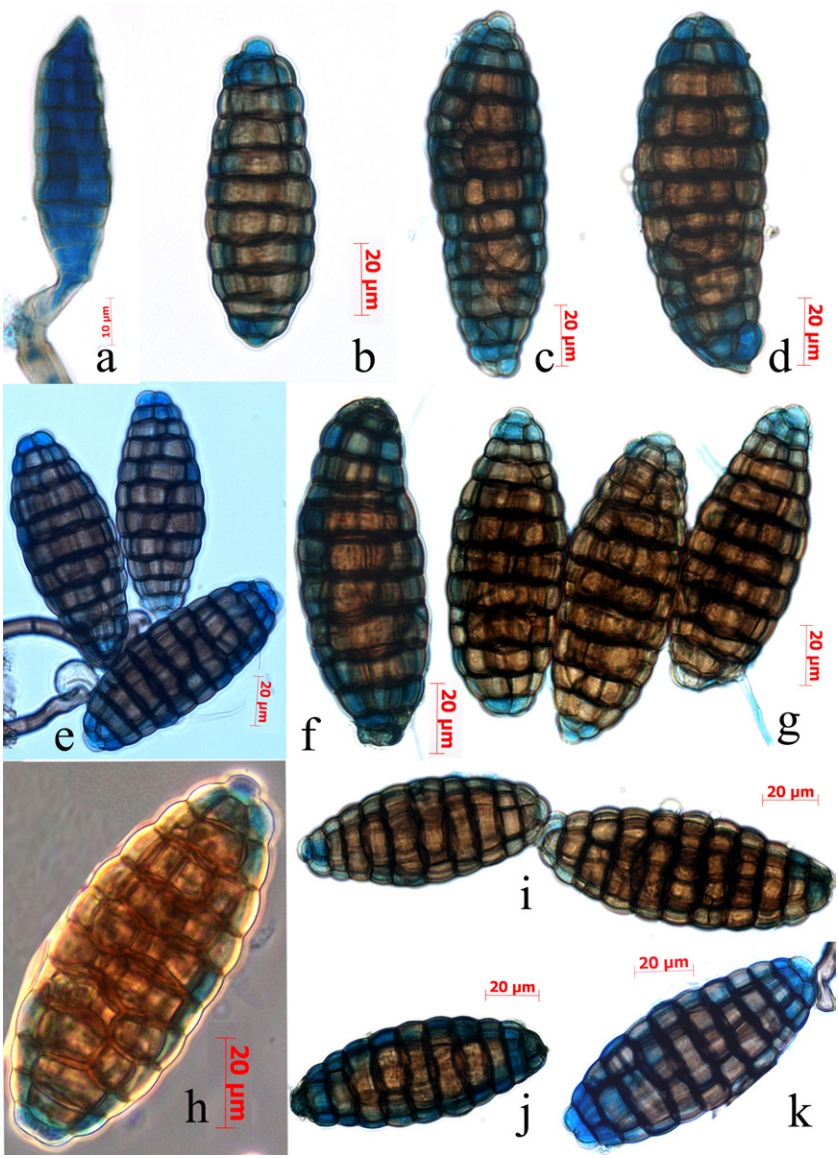

Fig. 2. *Manoharachariella indica* (holotype): a. Conidial development. b–c. Apiculate conidia. d,f–g,j–k. Variation in conidial size and shape. e. Conidia with conidiophores. h. Conidia under phase contrast view. i. Sticky conidia in false chain.

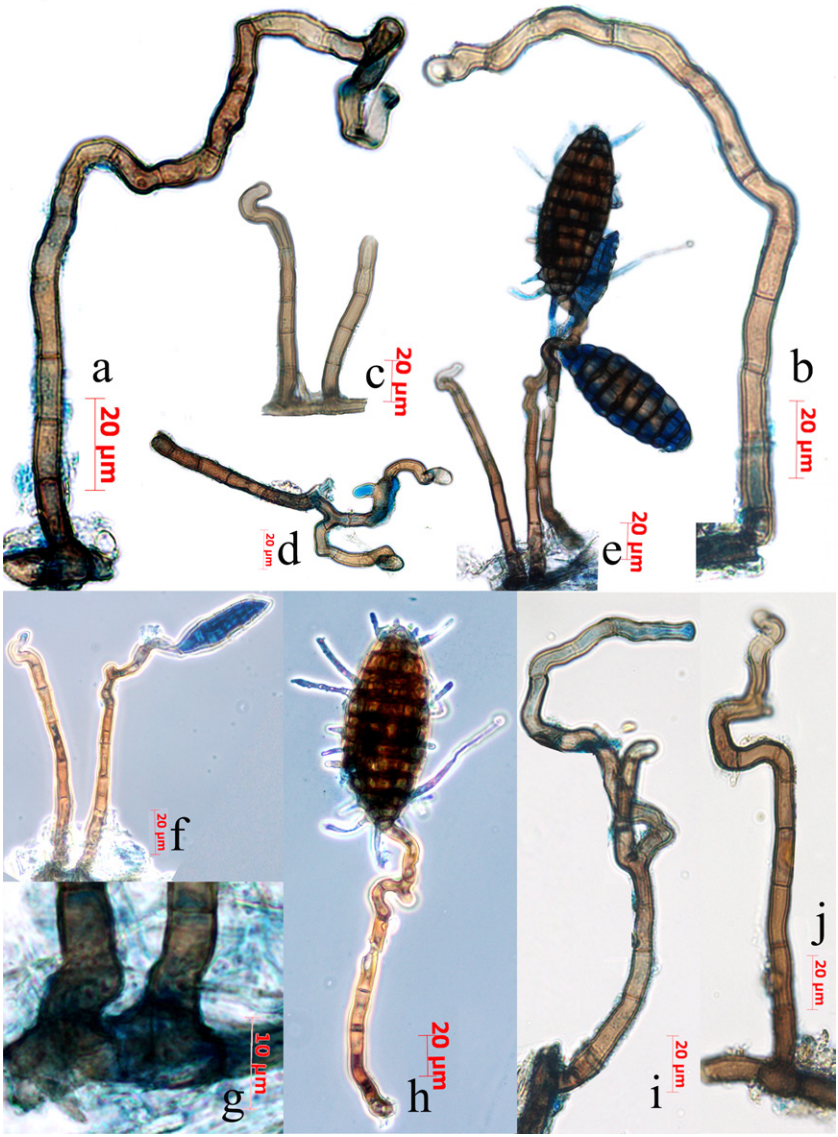

Fig. 3. *Manoharachariella indica* (holotype): a–b. Mature conidiophores. c. Young conidiophores. d. Hyphal branching and initiation of conidiophores in nature. e. Conidiophores and attached conidia. f. Conidiophores with young conidia. g. Foot cells of conidiophores. h. Mature conidia attached with conidiophores, showing multi-polar germination. i. Branched conidiophore. j. Simple conidiophore.

intercalary, pale to mid brown, 4.4–8.6 × 4–7.6 µm. Conidia solitary, dry or sticky, acropleurogenous, simple, doliiform, obpyriform, ellipsoidal or irregular, apiculate, apiculus rounded or obtuse, smooth, dictyoseptate, longitudinally 10–13-septate, tiered, pale to dark brown or blackish brown, apical and basal tiers hyaline or subhyaline. 84–110(–120) × 31–44 µm; young conidia hyaline or subhyaline, 56 × 17 µm.

Conidia in nature are dry and/or sticky and also form false chains of 2–3 conidia. Conidial germination was observed as being multi-polar in moist chambers, but also after 12 hours of inoculation on PDA plates.

Colonies on PDA and MEA very slow growing, 1–2 mm diam after 14 days, pale brown, velutinous; reverse pale brown.

Teleomorph: not observed.

Discussion

The monotypic *Manoharachariella* with its type species *M. lignicola* somewhat resembles *Septosporium* Corda (especially *S. rostratum* M.B. Ellis, 1961) in having dictyoseptate beaked conidia but differs in the absence of setae, unbranched conidiophores, and percurrent conidiogenous cells. Two species of *Xenosporium* Penz. & Sacc. — *X. africanum* Piroz. (Deighton & Pirozynski 1966) and *X. boivinii* S. Hughes (Hughes 1978)— resemble *Manoharachariella* in conidial shape but differ in their monoblastic, acrogenous or acropleurogenous, obpyriform, apiculate, smooth and dictyoseptate conidia that are transversely longitudinally septate. In addition, secondary conidia are absent in *Manoharachariella* but present in *Xenosporium*. *Manoharachariella,* like *Bioconiosporium* Bat. & J.L. Bezerra (Ellis 1976), produces solitary dictyoseptate conidia but the conidia are monoblastic with single apiculus and lack the two large protuberances that are prominent in *Bioconiosporium*. Conidia in both *Monodictys* S. Hughes (Ellis 1971) and *Manoharachariella* are monoblastic, dictyoseptate, and acrogenous but those in *Manoharachariella* are apiculate and tiered. Bagyanarayana et al. (2009) noted all these differences when they established *Manoharachariella*.

Manoharachariella lignicola is differentiated from *M. indica* by its smaller (42.5–50.5 × 25–32 µm) 7–9 transversely septate conidia and smaller conidiophores (≤ 35 µm × 3–4.5 µm) with fewer (1–3) septa.

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We are indebted to Pedro W. Crous (Centraalbureau voor Schimmelcultures, Utrecht, The Netherlands) and Uwe Braun (Martin-Luther-University, Halle, Germany) for commenting on this manuscript. Thanks are also due to the Department of Science and Technology (DST), Government of India, New Delhi for providing financial support for setting up the National Facility for Culture Collection of Fungi (No. SP/SO/PS-55/2005) at MACS' Agharkar Research Institute, Pune, India, and the Director, MACS' ARI for providing facility.

Literature cited

Bagyanarayana G, Rao NK, Kunwar IK. 2009. *Manoharachariella*, a new dematiaceous hyphomycetous genus from India. Mycotaxon 109: 301–305. http://dx.doi.org/10.5248/109.301

Crous PW, Verkley GJM, Groenewald JZ, Samson RA (eds). 2009. Fungal Biodiversity. CBS Laboratory Manual Series. Centraalbureau voor Schimmelcultures, Utrecht, Netherlands.

Deighton FC, Pirozynski KA. 1966. Microfungi II. *Brooksia* and *Grallomyces*; *Acrogenotheca ornata* sp. nov.; the genus *Xenosporium*. Mycol. Pap. 105. 35 p.

Ellis MB. 1961. Dematiaceous hyphomycetes. III. Mycol. Pap. 79. 23 p.

Ellis MB. 1971. Dematiaceous hyphomycetes. CMI, Kew, UK. 608 p.

Ellis MB. 1976. More dematiaceous hyphomycetes. CMI, Kew, UK. 507 p.

Hughes SJ. 1978. New Zealand fungi. 25. Miscellaneous species. N. Z. J. Bot. 16(3): 311–370.

Rajeshkumar KC, Singh PN, Yadav LS, Swami SV, Singh SK. 2010. *Chaetospermum setosum* sp. nov. from the Western Ghats, India. Mycotaxon 113: 397–404. http://dx.doi.org/10.5248/113.397

Rajeshkumar KC, Hepat RP, Gaikwad SB, Singh SK. 2011a. *Pilidiella crousii* sp. nov. from northern Western Ghats, India. Mycotaxon 115: 155–162. http://dx.doi.org/10.5248/115.155

Rajeshkumar KC, Sharma R, Hepat RP, Swami SV, Singh PN, Singh SK. 2011b. Morphology and molecular studies on *Pseudocercospora kamalii* sp. nov. a foliar pathogen on *Terminalia* from India. Mycotaxon 117: 227–237. http://dx.doi.org/10.5248/117.227

Singh SK, Singh PN, Yadav LS, Hepat RP. 2009. A new species of *Gonatophragmium* from Western Ghats, India. Mycotaxon 110: 183–187. http://dx.doi.org/10.5248/110.183

Singh SK, Yadav LS, Singh PN, Sharma R, Rajeshkumar KC. 2010. A new record of *Gliocephalotrichum* (*Hypocreales*) from India. Mycotaxon 114: 163–169. http://dx.doi.org/10.5248/114.161